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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/473,315 12/28/99 MOSLEY

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EXAMINER

THOMAS, E

ART UNIT

PAPER NUMBER

2831

DATE MAILED:

03/07/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/473,315

Applicant(s)

MOSLEY, LARRY EUGENE

Examiner

Eric W Thomas

Art Unit

2831

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2000 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:
500. Correction is required.

The drawings are objected to because

The reference number "500" is pointing to both vias & the system.
Correction is required.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "512" has been used to designate both vias and collapse chip connection. Correction is required.

Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the plurality of controlled collapse chip connection sites" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 4-5, are rejected under 35 U.S.C. 102(e) as being anticipated by Herrell et al. (US 6,191,479 B1).

Regarding claim 1, Herrell et al. disclose in fig. 1, a plurality of conductive layers (13-14), embedded in a dielectric (12, 15, 18); and a plurality of vias (see fig. 3A-3B) coupling two conductive layers to a plurality of connection sites (16).

Regarding claim 4, the plurality of C4 connection sites have a pitch of 250 microns.

Regarding claim 5, the vias are plated through-holes.

Claims 6, 8-10, 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Farooq et al. (US 6,072,690).

Regarding claim 6, Farooq et al. disclose in fig. 3A, a plurality of first conductive layers (67), a plurality of second conductive layers (68) interlaced with the plurality of first conductive layers; a number of surfaces having a plurality of connection sites operable for coupling the capacitor to a substrate (not shown) using controlled collapse

chip connection (C4 – see col. 5 lines 15-20). A plurality of vias (64, 66) coupling the plurality of first and second conductive layers to two connection sites.

Regarding claim 8, the number of surfaces is two.

Regarding claim 9, Farooq et al. disclose in fig. 3 A, a multilayer capacitor having a number of outer surfaces, and a number of pads (69) located on two of the number of outer surfaces; wherein two of the number of pads are capable of being coupled to a substrate using a solder bump.

Regarding claim 10, the multilayer capacitor includes a number of parallel conductive layers and the number of pads are coupled to the number of parallel conductive layers through vias.

Regarding claim 17, Farooq et al. disclose in fig. 3A-3B, a system comprising a substrate having a surface (not shown); and a capacitor having a plurality of vias (64, 66) coupled to a plurality of conductive layers (67-68) in the capacitor, the capacitor is coupled to the surface at a plurality of connection sites (71).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Herrell et al. (US 6,191,479 B1).

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Regarding claim 2, Herrell et al. disclose the claimed invention except for the thickness of the capacitor. It would have been an obvious matter of design choice to form the capacitor of Herrell having a thickness of between 0.5 mm to 1 mm, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re. Rose*, 105 USPQ 237 (CCPA 1955).

Regarding claim 3, Herrell et al. disclose the claimed invention, except for the capacitance being from 20 to 30 microfarads. It is well known in the capacitor art to form capacitors having a particular capacitance for an electrical system. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the capacitor of Herrell et al. having a capacitance of 20 to 30 microfarads, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 7, & 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farooq et al. (US 6,072,690).

Regarding claim 7, Farooq et al. disclose the claimed invention except for the material used in the conductive layers. Tungsten paste is a well known material used as electrodes in the capacitor art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the conductive layers of Farooq et al. using tungsten paste, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 11, Farooq et al disclose the claimed invention except for the number of conductive layers is greater than about 50. The capacitor of Farooq et al. is not limited to the illustrated embodiments. It is well known in the capacitor art to use more than 50 electrode layers (conductive layers) to form a capacitor (in efforts to increase capacitance). It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a capacitor having more than 50 layers of electrodes, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Regarding claim 12, Farooq et al. disclose the claimed invention except for the number of pads is greater than about 4000. The capacitor of Farooq et al. is not limited to the illustrated embodiments. It is well known in the capacitor art to use more than 4000 connecting pads. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a capacitor having more than 4000 pads, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

4,328,530 – Disclose capacitor structure comprising multiple conductive sheets & vias.

4,831,494 – Disclose capacitor comprising multiple pads

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5,972,053 – Disclose capacitor comprising multiple conductive sheets & vias.

6,023,407 – Disclose capacitor comprising multiple conductive sheets & vias.

6,034,864 – Disclose capacitor comprising multiple conductive sheets & vias.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric W Thomas whose telephone number is (703) 305-0878. The examiner can normally be reached on Mon-Thur & alternating Friday 6:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kristine Kincaid can be reached on (703) 308-0640. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7722 for regular communications and (703) 305-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 357-5076.

A handwritten signature in black ink, appearing to read "Anthony", with a stylized flourish at the end.

ewt
February 28, 2001